

Ecological Inventory of Wetland Sites in the Thompson Chain of Lakes and Vicinity

Prepared for the
Montana Department of Fish, Wildlife, and Parks

Submitted by
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SUMMARY OF FINDINGS

The Montana Natural Heritage Program surveyed seven wetland sites comprising 16 individual wetlands in the Thompson Chain of Lakes and vicinity (Figure 1). Five of these sites are located in and around the Thompson Chain of Lakes (Figure 2), while the remaining two sites are located to the east along the Little Blackfoot River and around Rogers Lake (Figure 3). These sites were inventoried and evaluated using the methodology described in Greenlee (1999). Table 1 provides a summary of the criteria used to evaluate the ecological significance of these sites. All sites were surveyed in the summer of 1999.

The sites surveyed encompassed a diversity of wetland types, including poor fens, depressional potholes, spring/seeps, lacustrine fringe, and beaver-modified riverine wetlands. Structurally, emergent communities are the most common vegetation types with shrub-dominated communities well represented. Forested wetland communities were inventoried only at Rogers Lake and are represented by small stands of wet spruce and aspen.

We documented several occurrences of rare plants and animals. Three populations of rare plants were identified: slender cottongrass (*Eriophorum gracile*) and pod grass (*Scheuchzeria palustris*) were found at Crystal Lake and poor sedge (*Carex paupercula*) was found at Rogers Lake. Common loon (*Gavia immer*) and black tern (*Chlidonias niger*) were observed at Rogers Lake, and common loon was also observed at Upper Thompson. In addition, we documented several common wetland plant associations in excellent condition, including slender sedge (*Carex lasiocarpa*), beaked sedge (*Carex utriculata*), and Drummond willow / beaked sedge (*Salix drummondiana* / *Carex utriculata*).

Ecological Significance

Overall, the sites inventoried are of high to moderate ecological significance. Specifically, Rogers Lake, Crystal Lake, Upper Thompson, and Lily Pad Lake ranked as having high ecological significance, and Hidden Lake, Lower Thompson, and Boiling Springs ranked as having moderate ecological significance. Table 2 shows how sites were scored for each criterion as well as the overall score.

In evaluating these sites, two factors stand out as negatively influencing their functional integrity and long-term viability: past timber harvesting and the presence of exotic species. The surrounding uplands of all sites have been impacted by timber harvesting and associated roading. These activities may adversely effect the hydrology of these sites by increasing runoff, nutrient loading, and sedimentation. Most of the wetlands are buffered by Streamside Management Zones. These buffers have some overstory component remaining and may somewhat ameliorate adverse hydrological effects.

The second, and perhaps more troubling, adverse influence is the presence of exotic species, such as redtop (*Agrostis stolonifera*), Kentucky bluegrass (*Poa pratensis*), Canada thistle (*Cirsium arvense*), and reed canarygrass (*Phalaris arundinacea*). Exotic species are established at all sites except Hidden Lake. At most of the other sites, exotics are present with high constancy, but are restricted to drier locations, such as drawdown zones around potholes. The most adversely effected site is Lower Thompson, where reed canarygrass is dominant throughout the site. The widespread presence and high constancy of exotic species at these sites is probably related to past grazing.

LITERATURE CITED

Greenlee, J.T. 1999. Ecologically significant wetlands in the Flathead, Stillwater, and Swan River valleys. Unpublished report to the Montana Department of Environmental Quality. Montana Natural Heritage Program. Helena. 192 pp.

Figure 1. General location of wetland sites

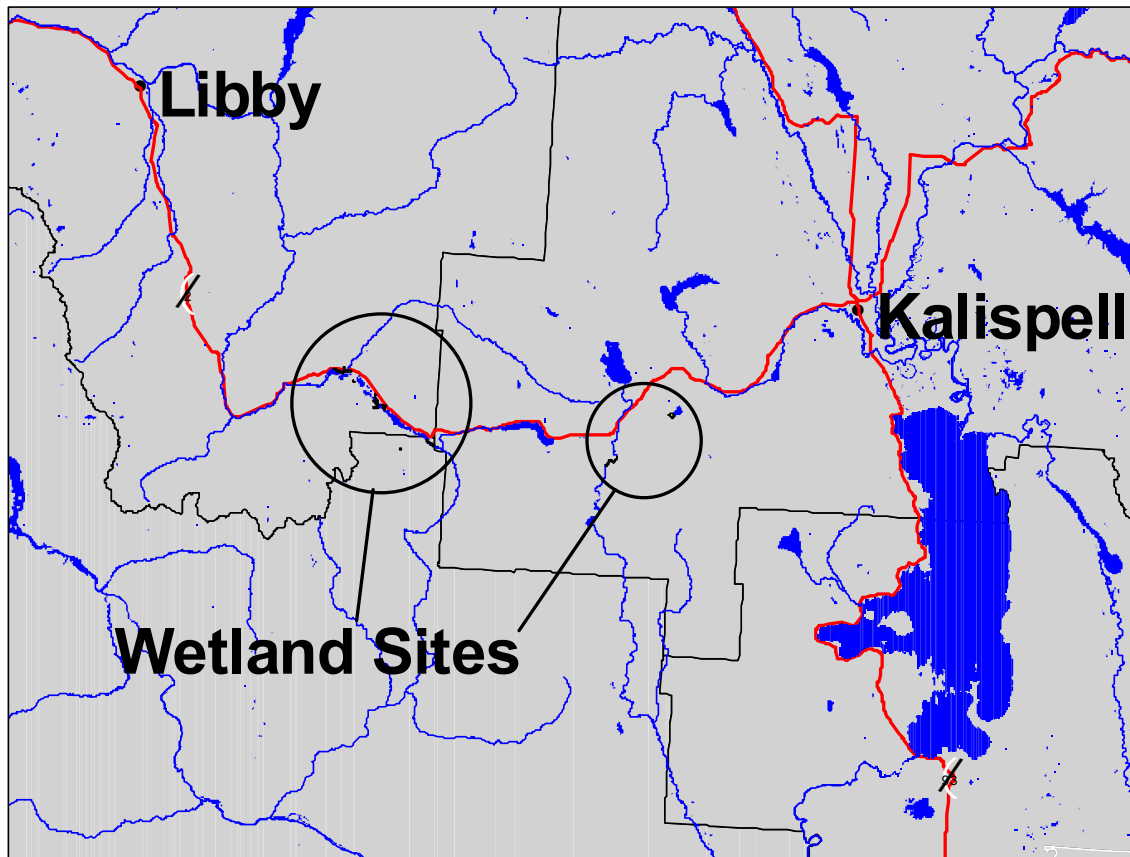
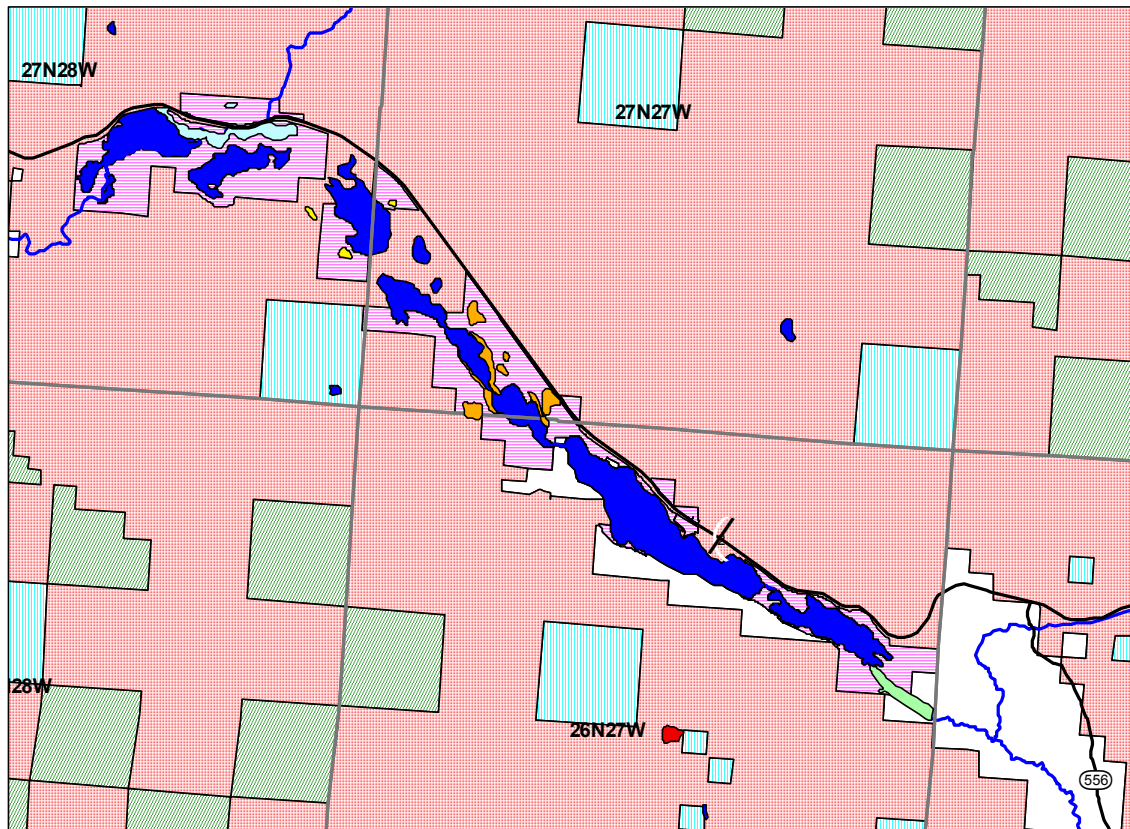


Figure 2. Thompson Chain of Lakes Sites (West)



Wetland Sites

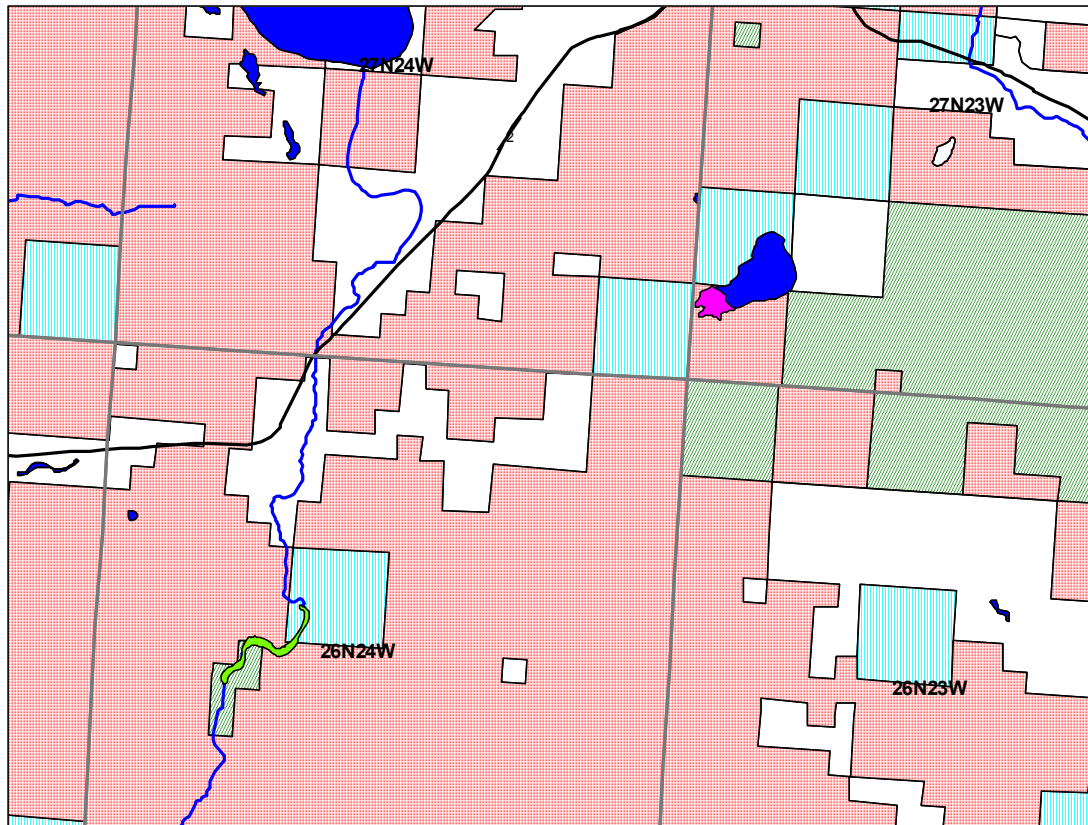
- Boiling Springs
- Crystal Lake
- Lily Pad Lake
- Lower Thompson
- Upper Thompson

Land Ownership Status

- USFS
- DNRC
- FWP
- Private, non corporate
- PCTC
- Lakes



Figure 3. Thompson Chain of Lakes Sites (East)



Wetland Sites

-  Hidden Lakes
-  Rogers Lake

Land Ownership Status







-  USFS
-  DNRC
-  FWP
-  Private, non corporate
-  PCTC
-  Lakes



Table 1. Definitions and criteria for ranking a site's ecological significance.

CRITERIA		DEFINITION	INDICATORS	RANKING SCORES
Richness		Habitat diversity within site	<ul style="list-style-type: none"> Assemblage of numerous plant communities within single unit of Cowardin's classification Assemblage of plant communities or ecological features (e.g., beaver ponds, peatlands, lakes) within several units of Cowardin's classification (= high structural diversity) 	3. Site has high diversity of vegetation types or wetland features. 2. Site has a moderate diversity of vegetation types or wetland features. 1. Site has low diversity of vegetation types or wetland features.
Rarity		Presence of state rare plant community, plant or animal species, and degree of rarity	<ul style="list-style-type: none"> High concentration of state rare plant or animal species Presence of globally rare species or communities 	3. Site has high concentration of rare species or communities. 2. Site has moderate concentration of rare species or communities. 1. Site has low concentration of rare species or communities 0. Site has no rare species or communities
Viability	Condition	Extent to which site conditions (e.g., processes, communities) depart from range of natural variation	Presence of on-site impacts (e.g., exotics, grazing, roads, ditching, irrigation withdrawal, recreational use, timber harvest)	3. Site in excellent condition; human impacts absent or minimal. 2. Site in good condition; some impacts apparent. 1. Site in poor condition; many impacts present.
	Size	Areal extent of wetland	Acreage	3. Site is large (>40 acres). 2. Site is moderately large (20-40 acres) 1. Site is small (5-20 acres) 0. Site is very small (<5 acres)
	Uplands	Landuse in surrounding uplands	Presence of off-site impacts (e.g., timber harvest, roads, homes, non-native vegetation)	3. Site with minimal off-site impacts. 2. Site with moderate level of off-site impacts. 1. Site with high level of off-site impacts.

Table 2. Overview and rank of Thompson Chain of Lakes wetland sites

Site	Richness	Rarity	Condition	Size	Uplands	Rank	Comments
Rogers Lake	2.5	1.5	2	3 (51 ac)	1.5	10.5	Diverse assemblage of communities, large, some communities grazed, uplands heavily logged and grazed around wetland, potential for subdivision, 1 rare plant, loons, black tern
Crystal Lake	2	1.5	3	1 (12 ac)	2	9.5	poor fen and potholes, 2 rare plants, timber harvest in uplands near potholes
Upper Thompson	1.5	1	2	3 (110 ac)	2	9.5	exotics have invaded a number of communities, timber harvest to the edge of all wetlands, past grazing, loons
Lily Pad Lake	2	0	3	3 (96 ac)	1.5	9.5	aquatic, emergent, shrub, and beaver activity; wetlands in good condition, but with road forming border of one, timber harvest around potholes
Hidden Lakes	1	0	3	3 (58 ac)	2	9	good condition beaver/willow complex, some logging in adjacent uplands
Lower Thompson	2	0	1.5	3 (57 ac)	2	8.5	large, moderately diverse with emergent, shrub & beaver activity, lots of <i>Phalaris arundinacea</i> , uplands with timber harvest and dispersed campsites
Boiling Springs	2	0	2	1 (17 ac)	2	7	large springs contribute to uniqueness of site, grazing has degraded some of the sedge community, logging/road building has taken place adjacent to site

BOILING SPRINGS



Location

The Boiling Springs site is located near the Thompson Chain of Lakes in the Salish Mountains of northwest Montana. From Kalispell travel approximately 60 miles west on U.S. Highway 2. Turn south on Lang Creek Cutoff Road. After 1.5 miles, turn southwest onto Boiling Springs Creek Road. Travel approximately 1.75 miles; the springs are adjacent to the road.

Description

This gently-sloping marsh and shrub-dominated wetland occurs at the toe of a slope in a narrow valley bottom. The water source is groundwater that intercepts an impermeable layer and wells up to the surface as seeps and springs. The two largest springs are 2-3 m in diameter and probably 2 m deep. Upwelling on the bottom of these pools disturbs sediments and is visible through the clear water. Other spring outlets appear to be overgrown by sedges and are discernible as small, deep openings surrounded by floating sedge mats. The water drains by surface and groundwater flow into an adjacent creek. The spring water is alkaline (pH = 8.03-8.55) and has low levels of dissolved solutes (conductivity = 190-200 uS/cm).

Two shrub communities occur above the main springs: a small *Alnus incana* (thin-leaved alder) community and a *Betula glandulosa* / *Carex utriculata* (bog birch / beaked sedge) community that is fed by numerous seeps. The *Alnus incana* community grades into a *Carex cusickii* (Cusick sedge) community immediately around the springs themselves. This community also occurs around some of the other smaller overgrown spring outlets. A *Carex utriculata* (beaked sedge) community occurs on the gentle slope between the springs and the creek. There are small upland "islands" scattered through the *Carex utriculata* community which are dominated by *Pinus contorta* (lodgepole pine), *Picea engelmannii* (Engelmann spruce), and *Pseudotsuga menziesii* (Douglas-fir). Dominance shifts from *Carex utriculata* to *Poa pratensis* (Kentucky bluegrass) in spots near these islands. No soil cores were taken, but this site appears to be more marsh than peatland, probably due to an ample flow of well-aerated groundwater.

Key Environmental Factors

An impermeable clay layer intercepts groundwater and causes the extensive seeps at this site. The resulting high groundwater table maintains these wetland communities.

Rarity

No occurrences of any special status plant or animal species were observed. One small occurrence of a G3 community, *Alnus incana* / *Carex* (*aquaticilis*, *deweyana*, *lenticularis*, *lanuginosa*, *luzulina*) Shrubland, was documented in excellent condition. Also, an undescribed *Carex cusickii*-dominated community was observed.

Other Values

Rana pretiosa (spotted frog) was observed around the largest springs.

Landuse

This site has probably been grazed in the past, as evidenced by old cowpies and the presence of *Poa pratensis* (Kentucky bluegrass) in drier portions of the site. However, the site does not appear to be currently grazed. The site appears to get little use.

Exotics

Poa pratensis (Kentucky bluegrass) and *Rumex* sp. are scattered in drier portions of the site. *Cirsium arvense* (Canada thistle) is rare but present throughout the site.

Uplands

The uplands have been logged in the past.

Information Needs

More information on landuse, especially grazing history. What is the source of water for the springs?

Management Needs

A road that runs around the uphill side of the site drains into the creek immediately below the site and is probably a major source of sediment.

Element Occurrence Information

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Alnus incana</i> / <i>Carex</i> (<i>aquaticilis</i> , <i>deweyana</i> , <i>lenticularis</i> , <i>lanuginosa</i> , <i>luzulina</i>) Shrubland	C	S?	G3
<i>Betula glandulosa</i> / <i>Carex utriculata</i> Shrubland	B	S4	G4?
<i>Carex cusickii</i> Dominance Type	*	*	*
<i>Carex utriculata</i> Herbaceous Vegetation	A	S5	G5

* rank not assigned

CRYSTAL LAKE



Location

These wetlands are part of the Thompson Chain of Lakes, which lie in the Salish Mountains of northwest Montana. From Kalispell, travel approximately 60 miles west on U.S. Highway 2. These wetlands are all within 0.5 mile of Crystal Lake, which lies near Happy's Inn, and can be reached via the system of logging roads built through the area.

Description

This site consists of three glacially-formed potholes occurring in a ground moraine that forms the drainage divide between the Thompson River and Pleasant Valley Fisher River watersheds. These wetlands are all topographically closed with no surface inlets or outlets. However, they are likely to have groundwater connections with nearby Crystal Lake. The conductivity of all three wetlands was low (50-140 uS/cm).

Two of the potholes (T27N R27W S19 SW1/4, T27N R28W S25 NW1/4) are compositionally and structurally similar. They occur in steep sided catchments and are dominated by aquatic communities. These aquatic communities are composed of a variety of floating-leaved and submerged plants such as *Potamogeton natans* (floating-leaved pondweed), *Potamogeton gramineus* (grass-leaved pondweed), *Nuphar lutea* (yellow water lily), *Utricularia vulgaris* (common bladderwort), and *Sparganium* sp. (bur-reed). The margins of each pothole are composed of a community that dries out seasonally as the water level draws down in late summer. Total plant cover is low in this zone, with *Agrostis stolonifera* (redtop) the dominant species. Other common forbs are *Mentha arvensis* (field mint), *Ranunculus pennsylvanicus* (Pennsylvania buttercup), *Galium trifidum* (small bedstraw), *Potentilla norvegica* (Norway cinquefoil), *Argentina anserina* (common silverweed), and *Cirsium arvense* (Canada thistle). The pH of the open water measured during the site visit was 6.9 to 7.8. The bottom of each pond is soft and muck-covered.

The remaining pothole is geomorphologically similar, but it is a poor fen rather than a shallow pond. It is not clear why significant peat accumulation has occurred in this depression and not the others, but perhaps there is more consistent groundwater seepage in this pothole. This would create permanently saturated conditions that in turn would lead to peat development. In any case, the wetland is dominated by a floating *Carex limosa* (mud sedge) community, which also has *Carex interior* (inland sedge), *Carex diandra* (lesser panicled sedge), *Menyanthes trifoliata* (bog buckbean), and high moss cover. An undescribed *Comarum palustre* (marsh cinquefoil) community

rings this floating mat. This community was dried down to peaty muck near the edge of the pothole, but had about 30 cm of water near the edge of the floating mat. The pH of the water in this pothole was 5.8, the most acidic of any measured in the Chain of Lakes area.

Key Environmental Factors

Seasonal flooding is the primary factor influencing vegetation patterns at this site.

Rarity

Eriophorum gracile (slender cottongrass, S2 / G4) and *Scheuchzeria palustris* (pod grass, S2 / G4) were documented in the poor fen. A moderately-sized occurrence of a G3 community, *Carex limosa* (mud sedge) Herbaceous Vegetation, was observed in excellent condition. There is also an undescribed *Comarum palustre* (marsh cinquefoil) community present. Both these communities occurred in the poor fen.

Other Values

Chrysemys picta (painted turtle) and *Ondatra zibethicus* (muskrat) were observed.

Landuse

Much of the area was historically grazed. Some sites probably receive some hunting and fishing use, but all appear relatively undisturbed.

Exotics

The drawdown zone around many of the depressions have a high constancy of exotics, including *Agrostis stolonifera* (redtop), *Cirsium vulgare* (bull thistle), *Cirsium arvense* (Canada thistle), and *Potentilla norvegica* (Norway cinquefoil).

Uplands

Nearly all surrounding uplands have been logged, although Stream Management Zones were generally observed with some overstory component remaining.

Information Needs

How much grazing occurred in this area in the past – this could explain high constancy of exotics (as could logging followed by deer dispersal). Are aquatic community-dominated lakes fed by groundwater? Historic aerial photographs from dry years could shed light on this.

Management Needs

Current and increased recreational use could create impacts to wetlands. Greater enforcement of existing regulations is needed (e.g., no felling of snags or disturbing loons).

Element Occurrence Information

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Agrostis stolonifera</i> Herbaceous Vegetation	*	S5	GM
Aquatic	*	*	*
<i>Carex limosa</i> Herbaceous Vegetation	B	S3	G3
<i>Carex utriculata</i> Herbaceous Vegetation	B	S5	G5
<i>Comarum palustris</i> Herbaceous Vegetation	*	*	*
<i>Typha latifolia</i> Western Herbaceous Vegetation	B	S5	G5
Vascular / Nonvascular Plant Elements			
<i>Eriophorum gracile</i> (slender cottongrass)	*	S2	G4
<i>Scheuchzeria palustris</i> (pod grass)	*	S2	G4

* rank not assigned

HIDDEN LAKES



Location

Hidden Lakes is located in the Salish Mountains of northwestern Montana. From Kalispell, travel 30 miles west on U.S. Highway 2. Turn south and travel 4 miles on an unnamed logging road. Park at the top of a canyon overlooking Hidden Lakes.

Description

This series of lakes occurs in a deep, narrow canyon on the Little Bitterroot River. Beaver activity at the upper end of the first lake has resulted in a large *Salix drummondiana* / *Carex utriculata* (Drummond's willow / beaked sedge) complex. The willows occur on sediment deposits and numerous old beaver dams and intermingle with small open-water channels. There are some openings in the willow community that are covered by a *Carex utriculata* community. An *Equisetum fluviatile* (water horsetail) community occurs at the head of the first lake below the willow community. The lakes are long and narrow with little emergent or aquatic vegetation. The surrounding uplands are a *Pseudotsuga menziesii* (Douglas-fir)-dominated forest, some of which has been selectively logged recently.

Key Environmental Factors

Castor canadensis (beaver) activity is a primary influence in structuring and forming the willow community. Beaver dams and the willow community is very important in sediment retention at this site.

Rarity

No special status plant or animal species or globally rare plant communities were observed.

Other Values

Rana pretiosa (spotted frog) was observed at the site.

Landuse

Current landuse appears to be limited to some fishing use in Hidden Lakes.

Exotics

No exotics were observed in the wetland. This site is isolated and wet.

Uplands

There is a dam on Little Bitterroot Lake, which affects water levels in the wetland. There has been logging in the uplands on both sides of the Little Blackfoot River (owned by Plum Creek Timber Company).

Information Needs

What is the extent of variation of flows in the Little Blackfoot River? Are there irrigation withdrawals?

Management Needs**Element Occurrence Information**

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Carex utriculata</i> Herbaceous Vegetation	A	S5	G5
<i>Equisetum fluviatile</i> Herbaceous Vegetation	A	S4	G4
<i>Salix drummondiana</i> / <i>Carex utriculata</i> Shrubland	A	S4	G4

LILY PAD LAKE



Location

These wetlands are part of the Thompson Chain of Lakes, which lie in the Salish Mountains of northwest Montana. From Kalispell, travel approximately 60 miles west on U.S. Highway 2. The Lily Pad Lake wetlands are about 1 mile west of Happy's Inn on Highway 2, where the Pleasant Valley Fisher River crosses the highway.

Description

This site is composed of two glacially-formed potholes that occur in a ground moraine in the Pleasant Valley Fisher River watershed and a willow bottom that occurs on this river just before it enters Loon Lake. One depression is topographically closed and probably connected by groundwater to the river. The other (Lily Pad Lake) is connected by surface water to the Pleasant Valley Fisher River. Beaver activity has played a large role in structuring the willow bottom. Water samples from these sites showed a pH range of 7.2-7.6, and a conductivity range of 80-170 uS/cm.

Both of the potholes are fairly steep sided, but one (T27N R28W S23 NW1/4 NE1/4) is relatively small and dominated by a *Carex utriculata* (beaked sedge) community with a fringe of *Salix bebbiana* (Bebb's willow) in the drawdown zone on the margins. The other, Lily Pad Lake, is a shallow lake with a deep muck bottom. This lake has a diverse aquatic plant community which is dominated by *Potamogeton natans* (floating-leaved pondweed), *Sparganium minimum* (small bur-reed), and *Nuphar lutea* ssp. *variegatum* (yellow water lily). There are also small patches of *Scirpus acutus* (hardstem bulrush), *Typha latifolia* (common cattail), and *Carex utriculata* around the lake. The willow bottom is a *Salix drummondiana* / *Calamagrostis canadensis* (Drummond's willow / bluejoint reedgrass) community. There are numerous beaver channels through this community.

Key Environmental Factors

Seasonal flooding is the primary factor influencing vegetation patterns at this site.

Rarity

No special status plant or animal species were observed. Two occurrences of G3 communities were observed: a very small example of *Salix bebbiana* (Bebb willow) Shrubland and a large occurrence of *Salix drummondiana* / *Calamagrostis canadensis* (Drummond willow / bluejoint reedgrass) Shrubland in very good condition.

Other Values

A family of *Mustela vison* (mink) was observed at Lily Pad Lake (1 adult and 4 young).

Landuse

Much of the area was historically grazed. Some sites probably receive some hunting and fishing use, but all appear relatively undisturbed.

Exotics

The drawdown zone around many of the depressions have a high constancy of exotics, including *Phalaris arundinacea* (reed canarygrass), *Cirsium arvense* (Canada thistle), and *Potentilla norvegica* (Norway cinquefoil).

Uplands

Nearly all surrounding uplands have been logged, although Stream Management Zones were generally observed with some overstory component remaining. Highway 2 runs immediately adjacent to Lily Pad Lake and the willow bottom.

Information Needs

How much grazing occurred in this area in the past – this could explain high constancy of exotics (as could logging followed by deer dispersal). Are aquatic community-dominated lakes fed by groundwater? Historic aerial photographs from dry years could shed light on this.

Management Needs

Current and increased recreational use could create impacts to wetlands. Greater enforcement of existing regulations is needed (e.g., no felling of snags or disturbing loons).

Element Occurrence Information

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Carex utriculata</i> Herbaceous Vegetation	A	S5	G5
<i>Nuphar lutea</i> ssp. <i>variegatum</i> Dominance Type	*	*	*
<i>Salix bebbiana</i> Shrubland	C	S3?	G3?
<i>Salix drummondiana</i> / <i>Calamagrostis canadensis</i> Shrubland	A	S?	G3
<i>Scirpus acutus</i> Herbaceous Vegetation	C	S5	G5
<i>Typha latifolia</i> Western Herbaceous Vegetation	B	S5	G5

* rank not assigned

LOWER THOMPSON

Location

Lower Thompson Lake is part of the Thompson Chain of Lakes and lies in the Salish Mountains of northwest Montana. From Kalispell, travel west on U.S. Highway 2 for approximately 60 miles. Turn south on Lang Creek Cutoff Road. After crossing the Thompson River, turn right and proceed approximately 0.75 mile. The surveyed wetlands are northeast of the road.

Description

This wetland occurs in the floodplain of the Thompson River immediately below the outflow of Lower Thompson Lake. The Thompson River is a low-gradient, meandering stream in this reach. Glaciation scoured out the valley in which the Thompson Chain of Lakes sit, and past and current beaver activity played a large role in the development of this marsh. Most of the plant communities at this site are flooded seasonally from run-off during early summer; however, Lower Thompson Lake maintains high water tables year round. *Scirpus acutus* (hardstem bulrush) communities occur in the deepest water at the edge of the slow-moving Thompson River. *Carex lasiocarpa* (slender sedge) floating mats form a 5-10 foot wide fringe adjacent to the *Scirpus acutus* communities in spots. *Typha latifolia* (common cattail) and *Carex utriculata* (beaked sedge) communities occupy large portions of the marsh, particularly behind old beaver dams. A community dominated by the exotic *Phalaris arundinacea* (reed canarygrass) occupies slightly drier locations than the previous communities, and it is the largest community present at this site. Although this community is dominated by *Phalaris arundinacea*, it also has a relatively large *Carex utriculata* and *Carex diandra* (lesser panicled sedge) component. This is somewhat unusual as *Phalaris arundinacea* usually forms monospecific stands. Perhaps hydrologic conditions are not optimal for *Phalaris arundinacea* at this site, thus creating this unusual stand. An *Alnus incana* (thin-leaved alder) community, codominated by *Alnus incana* and *Betula occidentalis* (water birch), occurs at the margins of the marsh, next to the upland. *Cornus sericea* (red-osier dogwood) and a large individual *Salix bebbiana* (Bebb willow) are also important overstory species. The herbaceous layer has about equal coverage of forb and graminoid species. Common species are *Carex utriculata*, *Carex diandra*, *Comarum palustre* (marsh cinquefoil), and *Mentha arvensis* (field mint). The exotic *Phalaris arundinacea* is also common.

Key Environmental Factors

The low-gradient valley as well as past and current beaver activity is primarily responsible for structuring these communities.

Rarity

No special status plant or animal species or globally rare communities were observed at this site.

Other Values

Rana pretiosa (spotted frog) was observed at this site.

Landuse

The site does not appear to receive much use, except for occasional fishing access. Drier portions of the site were historically grazed when Plum Creek Timber Company owned the area.

Exotics

Phalaris arundinacea (reed canarygrass) dominates the majority of the marsh. It is also present at low cover in an adjacent, drier *Alnus incana* (thin-leaved alder) community. Wetter sites have no exotic species present.

Uplands

Uplands have been logged in the past. Dispersed campsites are present around the edge of the wetland.

Information Needs

Management Needs

Phalaris arundinacea (reed canarygrass) should be monitored in the wetland to detect increases in cover. Similar monitoring would be useful in other Thompson Chain of Lakes wetland sites.

Element Occurrence Information

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Alnus incana</i> Shrubland	B	S3	G?Q
<i>Carex lasiocarpa</i> Herbaceous Vegetation	B	S4	G4?
<i>Carex utriculata</i> Herbaceous Vegetation	A	S5	G5
<i>Phalaris arundinacea</i> Western Herbaceous Vegetation	*	S4	G5
<i>Scirpus acutus</i> Herbaceous Vegetation	B	S5	G5
<i>Typha latifolia</i> Western Herbaceous Vegetation	A	S5	G5

* rank not assigned

ROGERS LAKE



Location

Rogers Lake is located in the Salish Mountains of northwest Montana. From Kalispell, travel west on U.S. Highway 2 for approximately 18 miles. Turn south on Forest Route 914. Travel for about 5 miles to Rogers Lake. Travel around the north side of the lake. The wetlands are located at the southwest end of the lake.

Description

Rogers Lake is a large, glacially-formed depression. Several small creeks flow into the basin, but at current lake levels there is no surface outlet. Water chemistry measurements indicate that pH is circumneutral (pH=7.5), and that there are low concentrations of dissolved solutes (conductivity = 90uS/cm).

The wetland at the southwest end of Rogers Lake is composed of a floating sedge mat surrounded by marsh vegetation. The large floating mat is a *Carex lasiocarpa* (slender sedge) community that rises and falls with the water level. Surrounding the mat is a *Carex utriculata* (beaked sedge) community that is anchored to the substrate; thus water depths are much greater in this community than in the former. Both are in excellent condition. There are some small patches of *Typha latifolia* (common cattail) in the marsh as well. On the margins of the marsh and in some of the small "fingers" of the wetland that project to the west, there are some small, moderately impacted *Betula occidentalis* (water birch) communities. On the south edge of the wetland, on part of the lakeplain where a creek enters, there is a wet spruce forest composed of *Picea engelmannii* / *Calamagrostis canadensis* (Engelmann spruce / bluejoint reedgrass) and *Picea engelmannii* / *Equisetum arvense* (Engelmann spruce / field horsetail) communities. These are in good condition. On the opposite side of the lake is a small *Populus tremuloides* / *Poa pratensis* (quaking aspen / Kentucky bluegrass) community that has been degraded by grazing. The surrounding uplands are *Pseudotsuga menziesii* / *Calamagrostis rubescens* (Douglas-fir / pinegrass) forest.

Key Environmental Factors

The three creeks at the southwest end of the lake contribute surface water and are probably important in structuring marsh community formation.

Rarity

An occurrence of *Carex paupercula* (poor sedge, S3 / G5), located in the *Picea engelmannii* / *Equisetum arvense* (Engelmann spruce / field horsetail) community, was documented at this site. *Chlidonias niger* (black tern, S3B,

SZN / G4) and a pair of *Gavia immer* (common loon, S1S2B, SZN / G5) were observed at this site. This site also contains *Betula occidentalis* (water birch) communities of uncertain classification status.

Other Values

Rana pretiosa (spotted frog) was observed at this site.

Landuse

The northern portion of the site appears to have been grazed in the past along the wetland margin. Timber harvest has occurred along the southern portion of the site adjacent to the *Picea engelmannii* / *Equisetum arvense* (Engelmann spruce / field horsetail) community.

Exotics

The marsh is remarkably free of exotics, especially *Phalaris arundinacea* (reed canarygrass). Exotics are limited to the *Populus tremuloides* (quaking aspen) community. This formerly-grazed community is dominated by *Poa pratensis* (Kentucky bluegrass) in the groundlayer. *Phleum pratense* (common timothy), *Cynoglossum officinale* (hound's tongue), and *Potentilla recta* (sulphur cinquefoil) are also present at low cover.

Uplands

Timber harvest and grazing occur in the uplands. A streamside management zone buffers most of the wetland. Housing development is occurring around the lake with empty lots yet to be sold. Additional development may occur on the south side of the lake. Lake eutrophication is a possible consequence of this development.

Information Needs

Is the north edge of site currently grazed? A fence is present in the uplands near the aspen stand – does this fence exclude livestock from the lakeshore and marsh edge? How much of lake outflow is to groundwater.

Management Needs

Water quality monitoring is needed.

Element Occurrence Information

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Betula occidentalis</i> / <i>Carex utriculata</i> Dominance Type	C	*	*
<i>Carex lasiocarpa</i> Herbaceous Vegetation	A	S4	G4?
<i>Carex utriculata</i> Herbaceous Vegetation	A	S5	G5
<i>Picea engelmannii</i> / <i>Calamagrostis canadensis</i> Forest	B	S4	G4
<i>Picea engelmannii</i> / <i>Equisetum arvense</i> Forest	B	S4	G4
<i>Populus tremuloides</i> / <i>Poa pratensis</i> Dominance Type	*	*	*
<i>Typha latifolia</i> Western Herbaceous Vegetation	A	S5	G5
Animal Elements			
<i>Chlidonias niger</i> (black tern)	*	S3B, SZN	G4
<i>Gavia immer</i> (common loon)	*	S1S2B, SZN	G5
Vascular / Nonvascular Plant Elements			
<i>Carex paupercula</i>	*	S3	G5
* rank not assigned			

UPPER THOMPSON



Location

These wetlands are part of the Thompson Chain of Lakes, which lie in the Salish Mountains of northwest Montana. From Kalispell, travel approximately 60 miles west on U.S. Highway 2 to Upper Thompson Lake. These wetlands are all within 0.25 mile of Upper Thompson Lake and can be reached via the system of logging roads built through the area.

Description

This small complex is composed of five potholes and the wetland fringe that occurs on the margins of Upper Thompson Lake. All are glacial in origin and occur at the headwaters of the Thompson River. Three of the potholes in this complex are topographically closed, with no inlet or outlet, and the other two potholes drain (at least periodically) into Upper Thompson Lake via a surface water connection. All are likely to have groundwater connections to nearby Upper Thompson Lake.

All of the potholes are similar compositionally and structurally. They occur in catchments that slope gradually down to the wetland, and are dominated by marsh vegetation. Either *Typha latifolia* (common cattail) or *Scirpus acutus* (hardstem bulrush) dominates the wettest zones. These communities occupy the majority of the acreage in all but one pothole, which is somewhat shallower and dominated by a *Carex utriculata* (beaked sedge) community. All these potholes have been invaded to some extent by *Phalaris arundinacea* (reed canarygrass), which primarily occurs on the drier margins of the wetlands. At two of the potholes, the *Phalaris arundinacea* community intergrades with two other exotic-dominated communities, *Agrostis stolonifera* (redtop) and *Poa pratensis* (Kentucky bluegrass).

Three communities dominate the margins of Upper Thompson Lake. Each community is zonally distributed along a topographic and moisture gradient. From driest to wettest, these communities are a shrub margin, a floating sedge mat, and a *Scirpus acutus* community. Most of the shrub margin is flooded intermittently and dominated by a *Betula occidentalis* (water birch) community, although in spots dominance shifts to *Salix bebbiana* (Bebb's willow). The shrub community grades into a *Carex lasiocarpa* (slender sedge) floating mat, which is well-anchored on the edge adjacent the shrub community, and floating nearer the open water. This community is saturated year-round by water from Upper Thompson Lake. Between the sedge mat and the open water is a 10-30 foot wide band of *Scirpus*

acutus, which in turn grades into open water. This wetland vegetation occurs around approximately 30 percent of Upper Thompson Lake.

Key Environmental Factors

Seasonal flooding and fluctuations in lake level appear to be the primary influence on plant community structure.

Rarity

Gavia immer (common loon, S1S2B, SZN / G5) are known to nest in the vicinity. No special status plant species were observed; however, a G3 community, *Betula occidentalis* / *Cornus sericea* (water birch / red-osier dogwood), was documented in good condition.

Other Values

These sites provide wildlife habitat; birds observed include grebe and great blue heron. No amphibians were observed.

Landuse

Wet meadows around wetlands were historically grazed. Current recreational uses have resulted in some informal trail development. An ORV was driven partway into one of the depressional wetlands.

Exotics

Cirsium arvense (Canada thistle), *Cynoglossum officinale* (hound's tongue), *Poa pratensis* (Kentucky bluegrass), and *Phalaris arundinacea* (reed canarygrass) are present with high constancy. The presence of exotics is probably related to past grazing.

Uplands

The surrounding uplands are logged and roaded and now support many dispersed campsites. Campers have cut some snags for firewood. Highway 2 runs along the edge of one wetland (Eli Lake).

Information Needs

Do historic aerial photographs show amount of *Typha latifolia* (common cattail) around Eli Lake prior to construction of Highway 2? How much grazing occurred in this area in the past – this could explain high constancy of exotics (as could logging followed by deer dispersal). Are aquatic community-dominated lakes fed by groundwater? Historic aerial photographs from dry years could shed light on this.

Management Needs

Current and increased recreational use could create impacts to lacustrine fringe wetlands. Greater enforcement of existing regulations is needed (e.g., no felling of snags or disturbing loons).

Element Occurrence Information

Plant Association / Community Type	EO Rank	S Rank	G Rank
<i>Agrostis stolonifera</i> Herbaceous Vegetation	*	S5	GM
Aquatic	*	*	*
<i>Betula occidentalis</i> / <i>Cornus stolonifera</i> Shrubland	B	SP	G3?
<i>Calamagrostis canadensis</i> Western Herbaceous Vegetation	C	S4	G4
<i>Carex lasiocarpa</i> Herbaceous Vegetation	A	S4	G4?
<i>Carex utriculata</i> Herbaceous Vegetation	A	S5	G5
<i>Juncus balticus</i> Herbaceous Vegetation	B	S5	G5
<i>Phalaris arundinacea</i> Western Herbaceous Vegetation	*	S4	G5
<i>Poa pratensis</i> Semi-natural Seasonally Flooded Herbaceous Alliance	*	SW	GW
<i>Salix bebbiana</i> Shrubland	C	S3	G3
<i>Scirpus acutus</i> Herbaceous Vegetation	A	S5	G5
<i>Typha latifolia</i> Herbaceous Vegetation	A	S5	G5

Animal Elements

<i>Gavia immer</i> (common loon)	*	S1S2B, SZN	G5
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* rank not assigned

APPENDIX. GLOBAL AND STATE RANK GUIDELINES

For state ranks, substitute S for G in these definitions

- G1 = Critically imperiled globally because of extreme rarity (typically five or fewer occurrences or very few remaining acres) or because of some factor(s) making it extremely vulnerable to extirpation.
- G2 = Imperiled globally because of extreme rarity (typically six to 20 occurrences or few remaining acres) or because of some factor(s) making it very vulnerable to extirpation.
- G3 = Vulnerable; either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single Great Plains state, a single physiographic or ecoregional unit) or because of other factors making it vulnerable to extirpation throughout its range.
- G4 = Apparently Secure; Uncommon, but not rare (although it may be quite rare in parts of its range, especially at the periphery). Apparently not vulnerable in most of its range.
- G5 = Secure; Common, widespread, and abundant (though it may be quite rare in parts of its range, especially at the periphery). Not vulnerable in most of its range.
- GU = Unrankable; Status cannot be determined at this time.
- G? = Unranked; Status has not yet been assessed.

GM/GW = Designates a community that is modified and dominated by cultivated or weedy species.

Modifiers and Rank Ranges

- ? A question mark added to a rank expresses an uncertainty about the rank in the range of 1 either way on the 1-5 scale.
- G#G# Greater uncertainty about a rank is expressed by indicating the full range of ranks which may be appropriate.
- Q A "Q" added to a rank denotes questionable taxonomy. It modifies the degree of imperilment and is only used in cases where the type would have a less imperiled rank if it were not recognized as a valid name (i.e. if it were combined with a more common type).
- P Assigned at the state level. There is potential that the element occurs in the state, but no extant or historic occurrences are accepted.
- R Assigned at the state level. Element is reported as occurring in the state but without a basis for either accepting or rejecting the report.

CRITERIA USED FOR RANKING

The criteria for ranking are based on a set of quantitative and qualitative factors. These factors are listed below in order of their general importance:

- a. Number of Element Occurrences (EOs):
the estimated number of EOs throughout the Element's global range;
- b. Abundance:
the estimated global abundance of the Element (measured by number of individuals, or area, or stream length covered);
- c. Size of Range:
the estimated size of the Element's global range;
- d. Distribution trend:
the trend in the Element's distribution over it's global range;
- e. Number of protected EOs:
the estimated number of adequately protected EOs throughout the Element's global range;
- f. Degree of threat:
the degree to which the Element is threatened globally;
- g. Fragility:
the fragility or susceptibility of the Element to intrusion;
- h. Other global considerations:
for example, the quality or condition of EOs that affect or may affect endangerment status; unexplained population fluctuations; reproductive strategies that are dependent on specific habitat; etc.